

Wall Backfill, Keying and Benching of Embankments, and Drainage Filters Best Practices

Below are some best practices you should follow when working with wall backfill, keying and benching of embankments, and drainage filters.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

Sections

- **Drainage**
- **Compaction**
- **Concrete Compressive Strength**
- **Backfill Material**

Drainage

- Drainage is essential to the long-term performance of a retaining wall as large lateral pressure can build up and cause wall deformation, or even failure, if the wall is not properly drained.**
- Drainage systems may include:**
 - Drainage sheets
 - Drain tile
 - Weep holes
 - Or a combination of these
- It is important that during installation, the drainage system is not contaminated with fines or other materials that may impede the flow of water.**

- All aspects of the drainage system should be carefully inspected to ensure proper installation, and to ensure that they are properly graded so that water is able to move out of the wall system.
- In addition to the drainage system, the site should be graded properly to reduce infiltration of water into the wall backfill.

Compaction

- When compacting wall backfill, be sure to avoid heavy equipment (including large compaction equipment) within 3 feet of the back of the wall.
- Hand compactors are best for this area.
- Also avoid over-compacting within 3 feet of the back of the wall.
- Both of these instances can cause wall deflection and damage.

Concrete Compressive Strength

- Walls should not be backfilled until concrete has achieved a minimum compressive strength (example 2,000 psi).
- If a wall is designed to be supported on the opposite side (by a floor for example), there is typically a maximum height in which backfill is allowed.
- When this maximum allowable fill height is achieved, backfilling must be halted until the wall has been supported (the floor is poured in this case).
- Inspectors should make sure that when backfill material is piled upon delivery within the backfill area, the material is spread evenly to construct the proper lift thickness.

- Oftentimes inspection observations at this location are forgotten and neglected, and lift thicknesses become excessive.
- Where reinforcements are used in the fill, construction equipment should not travel directly upon the reinforcement.
- Fill should be placed and spread out in front of the equipment in order to provide cover for the reinforcement.

Backfill Material

- Remember to keep an eye on the material being used as backfill at the project site.
- Even if the material is coming out of the same source location, the material may be coming out from a different local section of the borrow pit, or there may be a natural variation in the specific source area as it transitions to a different material.
- If there is any question of a material change, it is advisable to send it to the lab for testing.